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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,036	11/16/2000	Akitaka Nakayama	001533	3155

7590

09/17/2003

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EXAMINER

AHMED, SHAMIM

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/713,036

Applicant(s)

NAKAYAMA ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/22/03 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-4,17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al (5,134,056) in view of Ohsumi et al (6,001,537).

As to claims 1-4, Schmidt et al disclose a method of manufacturing a printed circuit board, wherein conductive interconnects and plated through hole and solder pads are applied as portions of a printed conductor pattern are formed on a surface of a board (col.2, lines 61-65 and figure 1).

Schmidt et al also disclose that after forming the conductive patterns, a photosensitive solder resist material is coated onto the conductor pattern of the printed circuit board (col.3, lines 3-4 and figure 2).

Schmidt et al teach that a photosensitive film such as photoresist is applied over the entire solder resist and the photoresist is subsequently exposed in the desired regions with the help of a laser beam to form a light shielding mask (col.3, lines 16-20 and lines 28-32 and figure 4).

Schmidt et al also teach that the solder resist material, which is not exposed due to the light-shielding mask, is removed by a stripping process (col.3, lines 3-20, lines 28-col.4, lines 3).

Schmidt et al fail to teach that the photosensitive solder resist material is exposed by ultraviolet (UV) rays.

However, Ohsumi et al teach that ultraviolet rays are used to expose a photosensitive material on a surface of a predetermined pattern in order to form a precision pattern (col.5, lines 3-9 and col.6, lines 50-62).

By doing so, one could have a superior quality of patterns on a substrate with superior properties of both migration resistance and adhesiveness with the substrate as taught by Ohsumi et al.

As to claims 17 and 19, it would have been obvious to use the same laser device for the multiple process steps such as forming internal, outer circuits and an etching resist in order to reduce the processing cost.

As to claim 18, it would have been obvious to use the same type of photosensitive film to form inner and outer circuits and the solder resist so patterning or removing can be done by a similar solvent, which will reduce the processing cost.

5. Claims 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al (5,134,056) in view of Ohsumi et al (6,001,537, and further in view of Shinmoto et al (5,897,938).

Modified Schmidt et al discussed above in the paragraph 4 but fail to teach that the printed circuit board can be mark by utilizing a photosensitive marking material, which can be irradiating by a laser.

However, it would have been obvious to one skilled in the art at the time of claimed invention to mark the circuit board by laser marking, which is conventional as supported by Shinmoto et al.

Shinmoto et al teach that laser marking method is conventional in various fields including electronic parts, printed circuit board or the like.

Shinmoto et al teach that a substrate such as circuit board is marked by coating a photosensitive material over the board and then the photosensitive material is irradiated by a laser beam to form laser- irradiated and laser-unirradiated region (col.1, lines 9-26).

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Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Shinmoto et al's teaching into modified Schmidt et al's process for quickly marking the circuit board as taught by Shinmoto et al.

By doing so, one could provide a mark on a substrate on real time because the laser marking enables a high-speed fine marking as taught by Shinmoto.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Shamim Ahmed  
Examiner  
Art Unit 1765

SA  
September 16, 2003